02-09-07

AF

PTO/SB/21 (09-06)
Approved for use through 03/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	35

Application Number	10/734,050
Filing Date	December 11, 2003
First Named Inventor	GORDON, Andrew W.
Art Unit	1723
Examiner Name	Krishnan S. Menon
Attorney Docket Number	8021-28

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☑ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☑ Other Enclosure(s) (please Identify below):
  - Return Receipt Postcard

Remarks

The enclosed amended Brief is submitted in response to the Notification of Non-Compliant Appeal Brief mailed on January 19, 2007.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Ruden, McClosky, Smith, Schuster & Russell, P.A.		
Signature			
Printed name	Stanley A. Kim, Ph.D., Esq.		
Date	February 8, 2007	Reg. No.	42,730

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Stanley A. Kim, Ph.D., Esq.	Date	February 8, 2007

Express Mail EV 745414752 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re: Application of GORDON, Andrew W.

Application No.:	10/734,050	Examiner:	Krishnan S. Menon
Date filed:	December 11, 2003	Art Unit:	1723

For: MOBILE DESALINATION PLANTS AND SYSTEMS, AND METHODS FOR PRODUCING DESALINATED WATER

CERTIFICATE UNDER 37 CFR 1.8(A)
I hereby certify that this correspondence is deposited with the United States Postal Service with sufficient postage, as express mail, label no. **EV 745414752 US**, addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA, 22313-1450 on February 8, 2007.

_____, Reg. No. 42,730
Stanley A. Kim, Ph.D., Esq.

APPELLANT'S AMENDED BRIEF ON APPEAL

Mail Stop: Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Notification of Non-Compliant Appeal Brief ("the Notification") mailed on January 19, 2007, Appellant hereby submits this amended brief to correct the deficiencies set forth in the Notification.

I. Real Party in Interest

The real party in interest in this application is Water Standard Company, LLC.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of Claims

Claims 1-14 were included in the application when filed. In appellant's June 12, 2006 amendment, claims 1-14 were canceled and new claims 15-36 were added. In appellant's July 27, 2006 amendment, claim 29 was canceled; claims 15, 28, and 30 were amended; and new claims 37-41 were added. Accordingly, claims 15-28 and 30-41 are presently pending in the application. In the latest office action, which was mailed on October 13, 2006, claims 27 and 36 were allowed, claim 26 was objected to but indicated to be allowable, and claims 15-25, 28, 30-35, and 37-41 were rejected.

This appeal is taken with respect to pending claims 15-25, 28, 30-35, and 37-41, which are set forth in the Claims Appendix attached hereto.

IV. Status of Amendments

No amendments have been filed subsequent to the latest office action from which this appeal is taken.

V. Summary of the Claimed Subject Matter

Independent claims 15, 27, and 28 are involved in this Appeal.

Independent claim 15 is directed to a system for desalinating seawater to yield desalinated water and a concentrate (Fig. 13, 1301, Fig. 16, 1601, and paragraphs [0023], [0099], [0111], [0122], [0155], and [0222]). The system comprises a first sea-going vessel comprising a hull and being positioned on the surface of a body of seawater (Fig. 1, 101, Fig. 3, 101, Fig. 4, 101, Fig. 6, 101, Fig. 7, 101, Figs. 10-12, 101, Fig. 13, 1310, Fig. 14, 1310, Fig. 15, 1510, Fig. 16, 1610, and paragraphs [0019], [0032], [0131], [0140], [0142], [0144], and [0182]); a water desalination system installed on the first sea-going vessel (Fig. 1, 104, Fig. 2, 200, and paragraphs [0099], [0100], [0113], and [0155]), the water desalination system capable of removing salt from seawater (paragraphs [0031], [0099], [0111], [0122], [0155], and [0163]); a water intake system installed on the first sea-going vessel and comprising an apparatus for taking up seawater from the body of seawater (Fig. 1A, 202, 203, Fig.2, 201, Fig. 3, 202, and paragraphs [0100], [0103], [0131], [0156], [0157] and [0159]-[0161]), the apparatus comprising at least one water intake positioned in the body of seawater at a first depth (Fig. 6B, 201, Fig. 28, 201, and paragraphs [0131], [0156], and [0157]); and a mixing system for mixing the concentrate with seawater to yield a diluted concentrate (Fig. 9, 905, and paragraphs [0024], and [0144]-[0150]), the mixing system being installed on the first sea-going vessel in communication with the water desalination system (paragraphs [0130], [0144], and [0150]). The mixing system includes a space in which concentrate can be mixed with seawater to form the diluted concentrate, an inlet for introducing concentrate into the space, an inlet for introducing seawater into the space, and an outlet for discharging the diluted concentrate from the space (Fig. 9, 905,

and paragraphs [0145], [0146], [0170], and [0192]); and a concentrate discharge system for discharging the diluted concentrate from the first sea-going vessel (Fig. 2, 207, Fig. 4, 207, Fig. 7, 207, Fig. 8, 207, Fig. 28, 207, and paragraphs [0119]-[0124], [0132]-[0134], and [0137]), the concentrate discharge system being installed on the first sea-going vessel (Fig. 4, 207, Fig. 6, 207, Fig. 7, 207, Fig. 28, 207, and paragraphs [0122], [0128], [0129] and [0168]). The concentrate discharge system comprises at least one discharge port being positioned at a site not at the first depth (Fig. 6B, 201, 207, Fig. 28, 201, 207, and paragraphs [0131], [0156], and [0157]).

Independent claim 27 is directed to a system for desalinating seawater to yield desalinated water and a concentrate (Fig. 13, 1301, Fig. 16, 1601, and paragraphs [0023], [0099], [0111], [0122], [0155], and [0222]) comprising a first sea-going vessel being positioned on the surface of a body of seawater (Fig. 1, 101, Fig. 3, 101, Fig. 4, 101, Fig. 6, 101, Fig. 7, 101, Figs. 10-12, 101, Fig. 13, 1310, Fig. 14, 1310, Fig. 15, 1510, Fig. 16, 1610, and paragraphs [0019], [0032], [0131], [0140], [0142], [0144], and [0182]); a water desalination system installed on the first sea-going vessel (Fig. 1, 104, Fig. 2, 200, and paragraphs [0099], [0100], [0113], and [0155]) and capable of removing salt from seawater to yield desalinated water and a concentrate (paragraphs [0031], [0099], [0111], [0122], [0155], and [0163]); a water intake system installed on the first sea-going vessel in fluid communication with the water desalination system and comprising an apparatus for taking up seawater from the body of seawater (Fig. 1A, 202, 203, Fig.2, 201, Fig. 3, 202, and paragraphs [0100], [0101], [0103], [0110], [0131], [0156], [0157] and [0159]-[0161]), the apparatus positioned in the body of seawater at a first depth relative to

the surface of the body of seawater (Fig. 6B, 201, Fig. 28, 201, and paragraphs [0131], [0156], and [0157]); and a concentrate discharge system for discharging the concentrate from the first sea-going vessel (Fig. 2, 207, Fig. 4, 207, Fig. 7, 207, Fig. 8, 207, Fig. 28, 207, and paragraphs [0119]-[0124], [0132]-[0134], and [0137]), the concentrate discharge system being installed on the first sea-going vessel in fluid communication with the water desalination system (Fig. 4, 207, Fig. 6, 207, Fig. 7, 207, Fig. 28, 207, and paragraphs [0101], [0121], [0122], [0128], [0129] and [0168]). The concentrate discharge system comprises at least one discharge member positionable in the body of seawater (Fig. 6A, 207, Fig. 6B, 201, 207, Fig. 7, 207, Fig. 28, 201, 207, and paragraphs [0128]-[0132], [0156], and [0157]). The at least one discharge member comprises (a) a conduit through which concentrate can flow from the water desalination system to the body of seawater and (b) an aspirator through which seawater from the body of seawater can be drawn into the discharge member to mix with concentrate in the conduit (Fig. 2, 206, 207, and paragraphs [0130], [0134], and [0145]).

Independent claim 28 is directed to a method of desalinating seawater on a sea-going vessel positioned on the surface of a body of seawater (Fig. 23, 2310, and paragraphs [0023], [0027], [0035], and [0162]-[0168]). The method comprises the steps of intaking seawater from the body of seawater at a first depth into the vessel (Fig. 6B, 201, Fig. 28, 201, and paragraphs [0131], [0156], and [0157]); removing salt from the seawater taken into the vessel to yield desalinated water and a concentrate (paragraphs [0031], [0099], [0111], [0122], [0155], and [0163]); diluting the concentrate with seawater to yield a diluted concentrate (Fig. 9, 905, and paragraphs [0024], and [0144]-[0150]); and discharging the diluted concentrate into the body of

seawater at a site not at the first depth (Fig. 6B, 201, 207, Fig. 28, 201, 207, and paragraphs [0131], [0156], [0157], and [0169]-[0171]).

VI. Grounds of Rejection to be Reviewed on Appeal

A. Whether claims 15-26, 28, and 30-35 were properly rejected under the written description requirement of 35 U.S.C. §112, first paragraph.

B. Whether claims 15, 28, and 30 were properly rejected under 35 U.S.C. §102(e) as being anticipated by, or under 35 U.S.C. §103(a) as being obvious over Krylov (U.S. Patent No. 6,658,889).

C. Whether claims 28, 31, and 32 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Bosley (U.S. Patent No. 6,348,148).

D. Whether claims 15-23, 28, 30-35, and 37-41 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Lampe et al. ("PCS-Preussag Conversion Systems", Elsevier, 1997), in view of Permar (U.S. Patent No. 6,299,766) and/or Bosley (U.S. Patent No. 6,348,148).

VII. Argument

A. The written description rejections of claims 15-26, 28, and 30-35 are erroneous because the site of concentrate discharge is adequately described in the application.

Claims 15-26, 28, and 30-35 stand rejected for failing to meet the written description requirement of 35 U.S.C. §112, first ¶ because the limitation "not at the first depth" was alleged to "not seem to have support in the original disclosure." The pertinent part of independent claim 15 (from which claims 16-26 depend) recites:

> 15. A system for desalinating seawater to yield desalinated water and a concentrate, the system comprising:
>
> ...
>
> a water intake system installed on the first sea-going vessel and comprising an apparatus for taking up seawater from the body of seawater, the apparatus comprising at least one water intake positioned in the body of seawater at a first depth;
>
> ...
>
> a concentrate discharge system for discharging the diluted concentrate from the first sea-going vessel, the concentrate discharge system being installed on the first sea-going vessel and comprising at least one discharge port being positioned at a site not at the first depth.

The pertinent part of claim 28 (from which claims 30-35 depend) recites:

> 28. A method of desalinating seawater on a sea-going vessel positioned on the surface of a body of seawater, the method comprising the steps of:
>
> intaking seawater from the body of seawater at a first depth into the vessel
>
> ...
>
> discharging the diluted concentrate into the body of seawater at a site not at the first depth.

In his first argument, the examiner cited MPEP 2173.05(i) regarding negative limitations, but did not provide further explanation. MPEP 2173.05(i), citing Ex parte Parks,[1] states "... a lack of *literal* basis in the specification for a negative limitation may not be sufficient to establish

[1] 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993) ("...it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an appellant had possession of what was claimed.").

a prima facie case for lack of descriptive support." Although the exact words "not at the first depth" may not appear in the specification as filed, satisfying the written description requirement does not require *in haec verba* antecedence.[2] Rather, satisfying the written description requirement merely requires that the originally filed application convey to a person of ordinary skill in the art that the applicant invented the subject matter later claimed.[3] In other words, written description support for an element occurring in claim exists if the concept (and not necessarily the exact words) of the element is adequately described in the originally filed application.

The concepts of (i) a discharge port being located at a different depth than a seawater intake and (ii) a step of discharging diluted concentrate a depth differing from the depth of seawater intake are both more than adequately described in the originally filed application. As an example, these concepts are described at Figs. 6B and 28; paragraphs [128], [131], [156], [157]; and original claims 1 (discharge deeper than intake) and 4 (intake deeper than discharge). Moreover, the application teaches the general concept that positioning an intake and discharge at different depth levels (i.e., intake at a first depth and discharge a site not at the first depth) reduces or eliminates the uptake of discharged concentrate into the water purification system. Clearly, based on this teaching in the originally filed application, one of skill in the art would readily understand that appellant was in possession of these concepts.

In a second argument, the examiner stated that "there is no support for the possibility that the concentrate discharge is in the air, sprayed from the ship into the air 10 ft above the ocean

---

[2] In re Lukach, 440 F.2d 1263, 169 USPQ 795 (CCPA 1971).
[3] In re Smythe, 480 F.2d 1376, 178 USPQ 279 (CCPA 1973).

surface."[4] In making this statement, the examiner appears to imply that the written description requirement requires an applicant to describe the details of each and every different possible variation and nuance of a claimed invention. According to MPEP 2163, however, "[i]f a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, *even if every nuance of the claims is not explicitly described in the specification*, then the adequate description requirement is met."[5] In cases involving generic claim elements in predictable arts, strict application of the written description requirement could lead to ludicrous results. For example, in the present case, must the specification also have described concentrate discharge on a mountain top and on the moon in order to provide adequate written description support for the step of discharging concentrate at a depth differing from the depth of seawater intake?

B. Claims 15, 28, and 30 are neither anticipated by or obvious over Krylov (U.S. Patent No. 6,658,889) because Krylov fails to expressly or inherently teach or suggest a concentrate discharge port or discharge of diluted concentrate.

Claims 15, 28, and 30 stand rejected as being anticipated by or obvious over Krylov. A rejection of these claims based on §102 or §103 is clearly improper because Krylov fails to teach or suggest limitations present in independent claims 15 and 28 (from which claim 30 depends). For example, claim 15 recites "a concentrate discharge system ... comprising at least one discharge port," and claim 28 recites a step of "...discharging the diluted concentrate into the

[4] Note that the application at Fig. 4 and paragraph [122] describes an embodiment similar to that proposed by the examiner.

[5] See also, Vas-Cath, Inc. v. Mahurkar, 935 F. 2d 1555, 1563-64 (Fed. Cir 1991).

body of seawater at a site not at the first depth." Krylov does not describe or suggest either a discharge port or a discharge step (of either undiluted or diluted concentrate).

Although Krylov is completely silent on concentrate discharge, the examiner contends that the subject limitations are inherent. The examiner, however, has not met the burden of proof required to show inherency because he has not provided any evidence whatsoever showing that concentrate discharge would necessarily flow from Krylov, or that such discharge would necessarily be into a body of seawater (claim 28) or via a discharge port (claim 15).[6]

A second error relating to this rejection is that the examiner has repeatedly not addressed the substance of applicant's argument as is required by 37 CFR §1.104 (see also MPEP §707.07(f)). In the office actions dated August 8, 2006 and October 13, 2006, the examiner's entire response to appellant's repeated arguments that the examiner has failed to provide any evidence whatsoever that the allegedly inherent characteristic necessarily flows from Krylov and that several alternative possibilities exist,[7] was the conclusory statement:

> With respect to the Krylov reference, discharging the concentrate to the ocean would not constitute a patentable limitation over the reference. Discharging the concentrate is an inherent or implied teaching in the reference, as shown.

In repeatedly refusing to address the substance of appellant's argument, the examiner has

---

[6] MPEP §2112 indicates " '[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.' Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)" and "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)."

[7] See appellant's July 27, 2006 Amendment ("First, Krylov's ice slush might never be discharged of at all. For example, Fig. 9 suggests that melted ice slush is routed from the fish holding compartment to the ice slush tube for refreezing. Second, even if it could be definitively proven that the ice slush was discharged, such discharge might be into a land-based facility rather than a body of seawater. Land-based disposal is the most logical inference from Krylov because, for the purpose of preserving freshness, it would be desirable to keep the ice slush in contact with the fish even after off-loading to a land-based facility. Third, referring back to the first point, if no discharge was contemplated, then no discharge port would be required. And even if discharge was contemplated, various means other than a discharge port could be used, e.g., a bucket attached to rope which could be manually operated by a person on Krylov's vessel.").

failed to meet the requirement of rule 104, delaying prosecution of this application and necessitating this appeal.

C. The rejection of claims 28, 31, and 32 under 35 U.S.C. §103 over Bosley (U.S. Patent No. 6,348,148) is erroneous because Bosley fails to teach or suggest (i) discharging *diluted* concentrate and (ii) desalination on a sea-going vessel positioned on the surface of a body of seawater.

Claims 28, 31, and 32 stand rejected under 35 U.S.C. §103 for allegedly being obvious over Bosley. This rejection is erroneous because the examiner has failed to establish a prima facie case of obviousness as Bosley fails to teach or suggest all the claim limitations at issue.[8] The examiner's entire argument in support of this rejection was:

> Bosley teaches a continuous process for making desalinated water by reverse osmosis (abstract, figures) from seawater. The system is offshore, on a ship (column 4 line 65 teaches the system suspended from a ship, which would be 'on a ship' (during examination, the claims must be interpreted as broadly as their terms reasonably allow. In re American Academy of Science Tech Center, _____ F.3d _____, 2004 WL 1067528 (Fed. Cir. May 13, 2004) (The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation)); comprises a vessel (50) for producing a permeate (column 5 lines 4-67), concentrate discharge below the thermocline (lines 35 and 58), intake (column 5 lines 25-33), the intake of seawater and the discharge of concentrate at different levels, permeate delivery means comprises pipeline, transfer pumps, second vessel, etc: see column 5 lines 36-48.
>
> Depth of intake to avoid planktons: Bosley has the system operating at a depth, not at the surface, which would inherently avoid planktons.
>
> Bosley teaches mixing concentrate with seawater at the point of discharge for dilution – column 4 lines 1-20, which is an obvious equivalent of applicant's claim of diluting the concentrate and then discharging into a body of seawater.

[8] See, *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) (All the claim limitations must be taught or suggested by the prior art to establish prima facie obviousness).

Claim 28, from which claims 31 and 32 depend, recites:

> 28. A method of desalinating seawater on a sea-going vessel positioned on the surface of a body of seawater, the method comprising the steps of:
> intaking seawater from the body of seawater at a first depth into the vessel;
> removing salt from the seawater taken into the vessel to yield desalinated water and a concentrate;
> diluting the concentrate with seawater to yield a diluted concentrate;
> discharging the diluted concentrate into the body of seawater at a site not at the first depth.

Claim limitations that Bosley fails to teach or suggest include (i) diluting the concentrate with seawater prior[9] to the step of discharging, (ii) discharging diluted concentrate into the body of seawater, and (iii) desalinating water "on a sea-going vessel positioned on the surface of a body of seawater." The examiner concluded that limitations (i) and (ii) are obvious equivalents of Bosley's mixing concentrate with seawater *at the point* of discharge, but did not provide the required evidence showing that the alleged equivalency was recognized in the prior art.[10] The examiner also did not respond to appellant's evidence[11] and argument that active concentrate dilution before discharge is advantageous in protecting the marine environment and not equivalent to passive concentrate dilution after discharge. Further, the examiner failed to meet the requirement of rule 104 by repeatedly refusing to address the substance of appellant's argument.[12]

Regarding limitation (iii), the examiner argued that Bosley's "...system suspended from a

---

[9] I.e., if diluted concentrate is discharged, a step of diluting the concentrate must occur prior to discharge.
[10] See, In re Ruff, 256 F.2d 590, 118 USPQ 340 (CCPA 1958) ("In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents.")
[11] See e.g., paragraphs [0039] and [0040] of the specification.
[12] Despite appellant making arguments similar to the foregoing in his July 27, 2006 amendment and August 29, 2006 arguments for the pre-appeal brief conference, rather than providing evidence supporting that the alleged equivalency was recognized in the prior art, the latest two office actions simply rehash (almost verbatim) the conclusory argument used in the examiner's initial rejection set forth in the June 20, 2006 office action.

ship...would be '<u>on</u>[13] a ship'" as recited in claim 28. This argument is erroneous because Bosley fails to teach or suggest claim 28's desalination "*...on a sea-going vessel positioned on the surface of a body of seawater.*" Bosley teaches a reverse osmosis system 50 (which the examiner confusingly renames *vessel 50*) which performs desalination at least several fathoms *under* the surface of a body of seawater so that the water pressure at that deep location can drive the reverse osmosis step. In comparison, claim 28's desalination step is performed on a *sea-going vessel* positioned *on the surface* of a body of seawater (e.g., on a ship floating on the surface of the ocean). And even if one were to move Bosley's reverse osmosis system to the surface, it could not operate as the required water pressure would be absent. Accordingly, Bosley cannot be said to teach or suggest claim 28's "...desalinating seawater on a sea-going vessel positioned on the surface of a body of seawater."

D. The rejection of claims 15-23, 28, 30-35, and 37-41 under 35 U.S.C. §103 as being unpatentable over Lampe et al. ("PCS-Preussag Conversion Systems", Elsevier, 1997), in view of Permar (U.S. Patent No. 6,299,766) and/or Bosley is erroneous because the combination of references fails to teach all claim limitations.

Claims 15-23, 28, 30-35, and 37-41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Lampe, Permar, and/or Bosley. After struggling with the words in the latest office action, appellant does not believe it clearly communicates the bases of the rejection because the examiner does not directly compare the words of the subject claim limitations with what is described in the cited references. Instead, the examiner describes his

[13] In view of a previous rejection on a similar basis where appellant used the phrase "*aboard* a sea-going vessel," claim 28 was amended to recite "<u>on</u> a sea-going vessel" and appellant also expressly stated on the record that the amendment was to clarify that the claims were not intended to encompass a method utilizing Bosley's device secured to a location in a body of water by cables attached to ships.

very general interpretation of what the claimed subject matter is and how the references pertain to this generalization. The examiner also rejected several claims without providing any reason whatsoever. Accordingly, this rejection also fails to meet the requirement of rule 104.

For the purpose of this appeal, appellant understands that the examiner is alleging that the rejected claims are obvious over the combination of Lampe and Bosley, the combination of Lampe and Permar, and/or the combination of Lampe, Permar, and Bosley. This rejection was originally based on just the combination of Lampe and Bosley. Permar was added in the latest office action, although the examiner's argument appears to indicate that the Lampe/Bosley rejection was maintained. Each of the combinations is discussed below.

The Lampe/Bosley Combination fails to teach or suggest all claim limitations

Independent claim 15 (from which claims 16-23, 37, and 38 depend) recites the claim limitation:

> a mixing system ... installed on the first sea-going vessel ... and comprising a space in which concentrate can be mixed with seawater to form the diluted concentrate, an inlet for introducing concentrate into the space, an inlet for introducing seawater into the space, and an outlet for discharging the diluted concentrate from the space;

Independent claim 28 (from which claims 30-35 and 39-41 depend) recites the claim limitation "...discharging the diluted concentrate into the body of seawater at a site not at the first depth." As appellant previously argued, neither Lampe nor Bosley teach or suggest these limitations.[14]

In the current office action, the examiner responded the foregoing argument with the statement:

> With respect to the rejection of the claims over Lampe in view of Bosley, the "space for mixing" is not a patentable invention. It does not provide

[14] See In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (Among the criteria for establishing a prima facie case of obviousness, the combined prior art references must teach or suggest all claim limitations).

> any particular structure to differentiate the claimed invention from the teaching of the reference. Applicant's mixing of concentrate with seawater before discharge, the point of discharge and the relative dimensions, etc., would not constitute patentable inventions over the references over the references because the references in combination already identifies the problem addressed by the invention and teaches a solution to the problem which is an obvious equivalent of the claimed invention. Attorney's argument in this matter is not sufficient to overcome the rejection. Applicant must provide secondary evidence to prove that applicant's invention is patentable over the combined teaching of the references.

The foregoing statement is legally incorrect for a number of reasons.

First, the examiner erroneously argues that *individual limitations* (the space for mixing, mixing of concentrate with seawater before discharge, the point of discharge, and the relative dimensions) in the claims are not patentable. Appellant never claimed such limitations by themselves, but rather in the context of claims containing multiple limitations. In assessing the patentability of a claim, it is well-settled law that all limitations in that claim must be evaluated – not just one.

Second, Appellant disagrees with the examiner's statement that the "space for mixing" does not provide any particular structure to differentiate the claimed invention from the teaching of the reference. If the examiner is arguing that holes, voids, and spaces are not proper claim limitations, this is not the law.[15] A mixing space clearly is a physical thing that imparts a further limitation to claim 15 and is in no way difficult to detect in mechanical devices. Because neither Lampe nor Bosley teach a "space for mixing," the rejection is erroneous because the relied upon references do not teach or suggest this limitation.

Third, the examiner's argument that the rejected claims are unpatentable because the references in combination already identify the problem addressed by the invention and teach a

[15] See In re Newton, 414 F.2d 1400, 163 USPQ 34 (CCPA 1969).

solution to the problem which is an obvious equivalent of the claimed invention is erroneous. Numerous problems in all of the technical arts have known solutions. The law does not provide that once a solution to a problem is found that no other solutions to the particular problem are patentable.

The examiner's assertion that Appellant's solution to the problem is an obvious equivalent of what Bosley teaches is simply a conclusory statement unsupported by any evidence whatsoever. In fact, if anything, because Bosley proposes using mid-ocean currents to disperse undiluted concentrate, a skilled artisan in this field would have little reason or motivation to attempt to develop another solution to the problem. Thus, the most that the Bosley/Lampe combination suggests is to run a concentrate discharge pipe from a ship having a desalination system thereon. This combination achieves the goals of Lampe's and Bosley's systems, but in no way suggests appellant's innovation of pre-dilution of concentrate before discharge. Hereto, in contravention of rule 104, the examiner again simply ignored Appellant's prior arguments[16] of the advantages offered by diluting concentrate with seawater prior to discharge as compared to Bosley's dumping of *undiluted* concentrate directly into a mid-water location in a body of water for dispersion by ocean current.

Fourth, the examiner's requirement that appellant "...must provide secondary evidence to prove that applicant's invention is patentable over the combined teaching of the references" is also believed to be erroneous as appellant is unaware of any requirement that a patent applicant produce secondary evidence to establish patentability.

---

[16] See page 3 of Appellant's Argument for Pre-Appeal Brief Conference and page 14 of Appellant's July 27, 2006 Amendment ("Applicant's method allows significantly more control over the concentrate dilution process and thereby significantly more control over mitigating damage to the environment. This advantage is particularly important on a sea-going vessel-based desalination system that might operate at different locations having different geographies, some of which might not allow placement of a discharge pipe at a mid-water location (e.g., at a shallow location near shore) or at a location which exposes the discharged undiluted concentrate to an ocean current of sufficient strength to promote sufficient mixing to mitigate environmental damage.")

Regarding the rejected claims that depend from claims 15 and 28, the examiner admits that the combination of Lampe and Bosley fails to teach a number of the limitations recited therein,[17] but argues that the missing limitations each have equivalents described in Bosley and that in view of In re Fout,[18] Lampe and Bosley need not expressly suggest substituting the alleged equivalent components. Applicant disagrees with this argument for the reasons presented below.

Claim 16 recites "...the first sea-going vessel has a draught of more than 10 meters and the apparatus for taking up seawater from the body of seawater comprises a sea chest formed in the lower portion of the hull of the first sea-going vessel." Neither Lampe nor Bosley teach these limitations or any equivalent of these limitations. Relying on Gardner v. TEC Systems,[19] the examiner argues that the limitation of the "...vessel having a draught of 10 meters- this pertains only to the size of the ship, which is not patentable." The foregoing implies that Gardner stands for the general proposition that recitation of the size of a claim element cannot render the claim patentable. Claim 16, however, is not limited to merely a ship having a particular draft, but recites among other things the particular draft in combination with a sea chest. As the examiner noted, the court in Gardner held that where the only difference between the prior art and the claimed subject matter was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

---

[17] The particular location of the water intake and concentrate discharge, the intake at below the thermocline region and discharge above, the concentrate discharge having a plurality of ports, a mixing space aboard the ship, a sea-going vessel having a draft of 10 meters, and a sea chest.

[18] 675 F. 2d 297 (CCPA 1982).

[19] 725 F.2d 1338 (Fed. Cir. 1984).

In the present case, the cited dimensions relate to intake at a preferred depth with respect to a thermocline or plankton layer and are important for performance of the claimed desalination system. To illustrate, in a case where the plankton level is very near the surface of a body of water, a vessel with a draught of less than 3 meters and a sea chest intake would not likely be able to minimize plankton intake, whereas one with a draught of greater than 10 meters would. Thus, referring again to the Gardner case, the relevant dimension in this case could cause the vessel to perform differently.

Regarding claim 17, neither Lampe nor Bosley teach or suggest a "...water intake member extendible from the hull into the body of seawater, wherein the water intake is on the distal end of the water intake member and the first depth is greater than ten meters" or any equivalent thereof. The current office action failed to respond to this argument when it was presented in appellant's July 27, 2006 amendment and August 29, 2006 Arguments for the Pre-appeal Brief Conference Request.

Regarding claim 19, neither Lampe nor Bosley teach or suggest a discharge port at the indicated site. Moreover, in Bosley's device, discharge of concentrate at a depth shallower than the intake would appear to defeat the purpose of its mid-water discharge. The current office action also failed to respond to this argument when it was presented in appellant's July 27, 2006 amendment and August 29, 2006 arguments for the pre-appeal brief conference request.

Lampe and Bosley also fail to teach or suggest claim 20's "...wherein the at least one discharge port is positioned in or below a thermocline and the first depth is above the thermocline;" claim 21's "...wherein the at least one discharge port is positioned above a thermocline and the first depth is in or below the thermocline;" claim 22's "...wherein the water intake is movable such that the water intake system can intake water from various depths to

reduce the intake of plankton;" or claim 23's "...wherein the first sea-going vessel comprises a sea chest formed in the lower portion of the hull of the first sea-going vessel and a water intake member extendible from the hull into the body of seawater, and the water intake system can utilize either the sea chest or the water intake member to intake seawater." The current office action also failed to respond to these arguments when they were presented in appellant's July 27, 2006 amendment and August 29, 2006 arguments for the pre-appeal brief conference request.

As to claims 30, 31, 33-35, and 37-41 which depend from claim 28, for reasons similar to those presented above, appellant does not believe that any of these additional limitations are taught or suggested by Lampe or Bosley.

Each of the limitations in the foregoing dependent claims provides advantages to the subject desalination system depending on its particular application. None of these advantages are appreciated by Lampe or Bosley. Further, in contravention of rule 104, the examiner did not provide specific reasons for these rejections.

The Lampe and Permar combination fails to teach or suggest seawater intake at a first depth and concentrate discharge at a site other than the first depth

In the current office action, the examiner argued:

> Lampe teaches a system and a process of desalination using reverse osmosis as claimed, wherein the system is installed aboard a ship. However, Lampe does not teach the specifics of water intake and concentrate discharge.
>
> Permar teaches a desalination system for seawater having reverse osmosis membranes, in which the concentrate is diluted by mixing with seawater before discharge in a plenum (44) see abstract, column 1 lines 50-64, column 3 lines 23-40 and figure 1. It would be obvious to one of ordinary skill in the art at the time of the invention to use the teaching of Permar in the teaching of Lampe because Permar teaches a system which provides highly effective filtering with expenditure of considerably less energy and

> improved recovery from subsequent downstream filters in a series of filters, unlike the prior arts.

Although the examiner acknowledges that Lampe does not teach the specifics of water intake and concentrate discharge, he does not similarly acknowledge that Permar also fails to teach seawater intake at a first depth and concentrate discharge at a site other than the first depth. Nowhere in Permar is there mention of this limitation which is included in independent claims 15 and 28 from which the remainder of the claims rejected under this section depend. Furthermore, the individual additional limitations of each of the rejected dependent claims are also not taught or suggested by either Lampe or Permar. Accordingly, this rejection is in error.

The Lampe/Bosley/Permar combination fails to teach or suggest discharge of diluted concentrate

In the current office action, the examiner argued that:

> [i]t would have been obvious to one of ordinary skill in the art at the time of the invention to use the teaching of Bosley and Permar in the teaching of Lampe because Bosley teaches protecting the environment by diluting the concentrate at discharge; and Permar teaches diluting the concentrate in the system for improved performance, with concentrate discharged after dilution.

The foregoing argument is incorrect because Permar does not teach discharge of diluted concentrate. After carefully reviewing Permar (including the abstract, column 1 lines 50-64, column 3 lines 23-40 and figure 1 as noted by the examiner), appellant could not find a description of discharge of diluted concentrate. Rather, looking more closely at column 3 lines 23-40, Permar teaches dilution of concentrate prior to filtration – not discharge ("...seawater or other liquid is mixed with the recirculated concentrate prior to entering each of the reverse osmosis filters"). In Permar, the problem addressed relates specifically to a desalination system

featuring a plurality of reverse osmosis filters in series. In such a system, seawater passes through the first filter with high efficiency yielding a permeate and a concentrate more saline than seawater. The concentrate more saline than seawater is then passed through the second filter –but with less efficiency than with the first filter because the liquid being filtered is the concentrate (which is more saline than seawater). With each filter after the second, the filtering efficiency further decreases because the liquid being filtered becomes more and more saline. Permar proposes mitigating this problem by mixing the concentrate resulting from each filtering step with seawater prior to passing it through the subsequent downstream filters. In this way, each filter is more efficient because the liquid each filters is less saline than in the corresponding conventional configuration. Permar, however, does not describe discharge of diluted concentrate.

Because neither Lampe, Bosley, or Permar teach discharge of diluted concentrate, the combination of these references cannot teach all of the limitations of independent claims 15 and 28, nor any claim dependent thereon. Further, the combination of Lampe, Bosley, and Permar fail to teach the additional limitations recited in dependent claims 16, 17, 9-23, 31, 33-35, and 37-41. Accordingly, this rejection is in error.

VIII. Claims Appendix

15. A system for desalinating seawater to yield desalinated water and a concentrate, the system comprising:

a first sea-going vessel comprising a hull and being positioned on the surface of a body of seawater;

a water desalination system installed on the first sea-going vessel, the water desalination system capable of removing salt from seawater;

a water intake system installed on the first sea-going vessel and comprising an apparatus for taking up seawater from the body of seawater, the apparatus comprising at least one water intake positioned in the body of seawater at a first depth;

a mixing system for mixing the concentrate with seawater to yield a diluted concentrate, the mixing system being installed on the first sea-going vessel in communication with the water desalination system and comprising a space in which concentrate can be mixed with seawater to form the diluted concentrate, an inlet for introducing concentrate into the space, an inlet for introducing seawater into the space, and an outlet for discharging the diluted concentrate from the space; and

a concentrate discharge system for discharging the diluted concentrate from the first sea-going vessel, the concentrate discharge system being installed on the first sea-going vessel and comprising at least one discharge port being positioned at a site not at the first depth.

16. The system of claim 15, wherein the first sea-going vessel has a draught of more than 10 meters and the apparatus for taking up seawater from the body of seawater comprises a sea chest formed in the lower portion of the hull of the first sea-going vessel.

17. The system of claim 15, wherein the apparatus for taking up seawater from the body of seawater comprises a water intake member extendible from the hull into the body of seawater, wherein the water intake is on the distal end of the water intake member and the first depth is greater than ten meters.

18. The system of claim 15, wherein the at least one discharge port is positioned at a site deeper than the first depth.

19. The system of claim 15, wherein the at least one discharge port is positioned at a site more shallow than the first depth.

20. The system of claim 15, wherein the at least one discharge port is positioned in or below a thermocline and the first depth is above the thermocline.

21. The system of claim 15, wherein the at least one discharge port is positioned above a thermocline and the first depth is in or below the thermocline.

22. The system of claim 15, wherein the water intake is movable such that the water intake system can intake water from various depths to reduce the intake of plankton.

23. The system of claim 15, wherein the first sea-going vessel comprises a sea chest formed in the lower portion of the hull of the first sea-going vessel and a water intake member extendible from the hull into the body of seawater, and the water intake system can utilize either the sea chest or the water intake member to intake seawater.

24. The system of claim 15, wherein the first sea-going vessel comprises instrumentation and sensors for detecting the presence of and depth of thermoclines in the body of seawater.

25. The system of claim 15, wherein the first sea-going vessel comprises instrumentation and sensors for detecting the presence of and depth of plankton in the body of seawater.

27. A system for desalinating seawater to yield desalinated water and a concentrate, the system comprising:

a first sea-going vessel being positioned on the surface of a body of seawater;

a water desalination system installed on the first sea-going vessel and capable of removing salt from seawater to yield desalinated water and a concentrate;

a water intake system installed on the first sea-going vessel in fluid communication with the water desalination system and comprising an apparatus for taking up seawater from the body of seawater, the apparatus positioned in the body of seawater at a first depth relative to the surface of the body of seawater; and

a concentrate discharge system for discharging the concentrate from the first sea-going vessel, the concentrate discharge system being installed on the first sea-going vessel in fluid communication with the water desalination system and comprising at least one discharge

member positionable in the body of seawater and comprising (a) a conduit through which concentrate can flow from the water desalination system to the body of seawater and (b) an aspirator through which seawater from the body of seawater can be drawn into the discharge member to mix with concentrate in the conduit.

28. A method of desalinating seawater on a sea-going vessel positioned on the surface of a body of seawater, the method comprising the steps of:

intaking seawater from the body of seawater at a first depth into the vessel;

removing salt from the seawater taken into the vessel to yield desalinated water and a concentrate;

diluting the concentrate with seawater to yield a diluted concentrate;

discharging the diluted concentrate into the body of seawater at a site not at the first depth.

30. The method of claim 28, wherein the step of diluting the concentrate with seawater occurs on the vessel.

31. The method of claim 28, wherein the body of seawater comprises a layer of phytoplankton and the first depth is below the layer of phytoplankton.

32. The method of claim 28, wherein the concentrate is discharged at a site deeper than the first depth.

33. The method of claim 28, wherein the concentrate is discharged at a site more shallow than the first depth.

34. The method of claim 28, wherein the concentrate is discharged at a site in or below a thermocline and the first depth is above the thermocline.

35. The method of claim 28, wherein the concentrate is discharged at a site above a thermocline and the first depth is in or below the thermocline.

37. The system of claim 15, wherein the first sea-going vessel comprises at least one selected from the group consisting of (i) a means for regulating the salinity level of the concentrate to a level substantially equal to the salinity level of the seawater at the area where the concentrate is discharged and (ii) a means for regulating the temperature of the concentrate substantially equal to the temperature of the seawater at the area where the concentrate is discharged.

38. The system of claim 37, wherein the first sea-going vessel comprises both (i) the means for regulating the salinity level of the concentrate to a level substantially equal to the salinity level of the seawater at the area where the concentrate is discharged and (ii) the means for regulating the temperature of the concentrate substantially equal to the temperature of the seawater at the area where the concentrate is discharged.

39. The method of claim 28, wherein the diluted concentrate has a salinity level substantially equal to the salinity level of the seawater at the area where the concentrate is discharged.

40. The method of claim 28, wherein the diluted concentrate has a temperature substantially equal to the temperature of the seawater at the area where the concentrate is discharged.

41. The method of claim 28, wherein the diluted concentrate has a salinity level substantially equal to the salinity level of the body of seawater at the area where the concentrate is discharged and the diluted concentrate has a temperature substantially equal to the temperature of the seawater at the area where the concentrate is discharged.

IX. Evidence Appendix

Not applicable.

X. Related Proceedings Appendix

Not applicable.

XI. Conclusion

Although, appellant believes that no fee is due in connection with the filing of this paper, as the Commissioner had been authorized to charge the statutory fee of $250.00 with the submission of the original Brief on Appeal on December 7, 2006, the Commissioner is hereby authorized to charge any underpayment or credit any overpayment of fees under 37 CFR 1.17 as required by this paper to Deposit Account 50-3110.

Respectfully submitted,

Date: February 8, 2007

Stanley A. Kim, Ph.D., Esq.
Registration No. 42,730
RUDEN McCLOSKY, SMITH,
SCHUSTER & RUSSELL, P.A.
222 Lakeview Avenue
Suite 800
West Palm Beach, FL 33401-6112
Telephone: (561) 838-4512
Facsimile: (561) 514-3412